REMARKS

Claims 1-29 and 36-56 were pending when the Office Action was mailed. Applicants herein amend claims 1, 36, and 49-56 and do not cancel any claims or present any new claims. Accordingly, claims 1-29 and 36-56 remain pending.

The Office Action rejects claims 49-56 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Applicants herein amend claims 49-56 in the manner the Examiner has suggested and respectfully request that the Examiner withdraw this rejection.

The Office Action objects to the specification as failing to provide proper antecedent basis to support the recitation of "computer-readable storage medium" in claim 49. As discussed above, applicants herein amend claim 49 in the manner the Examiner has suggested and respectfully request that the Examiner withdraw this objection.

The Office Action rejects claims 1-29 and 36-56 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants herein amend claims 1, 36, and 49 to address the Examiner's concerns. Furthermore, claim 49 now recites "an access pointer pointing to the next word to be accessed such that when the buffer is accessed, the access pointer is incremented by the number of words being accessed." While the access pointer points to a single word, an access request may include multiple words, in which case multiple words are accessed starting with the word to which the access pointer points and the access pointer is incremented by the number of words accessed. Accordingly, applicants respectfully request that the Examiner reconsider and withdraw these rejections.

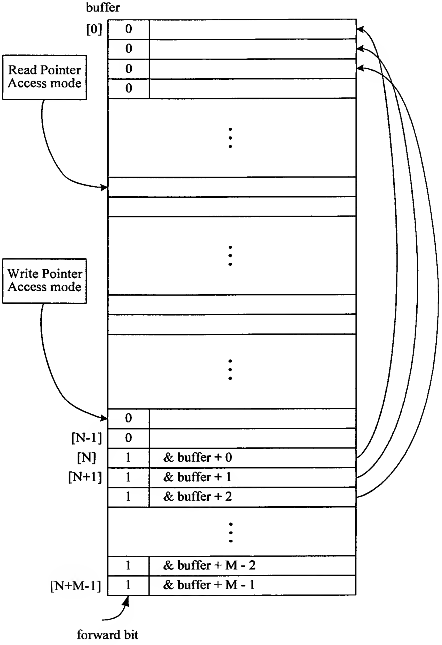
The following table reflects the remaining rejections presented in the Office Action:

Claims	Basis	References
36 and 48-52	102(e)	Soell
1-9, 13, 22-26, 38-44, and 53-56	103(a)	Soell and Niu
10-12 and 45-47	103(a)	Soell, Niu, and Johnson
14-21	103(a)	Soell, Niu, Ray, and Rahman
27-29	103(a)	Soell, Niu, and Drews
37	103(a)	Soell and Drews

Applicants respectfully traverse these rejections. Nevertheless, applicants herein amend the claims to clarify the subject matter for which they seek protection.

Applicants provide a technique for forwarding attempts to access words past the end of a circular buffer to words within the buffer. Applicants' technique stores in "forwarding words" located adjacent to the end of a circular buffer, pointers to words in the buffer. When an attempt to access the buffer extends beyond the end of the buffer and into a forwarding word, applicants' technique redirects the access to the location within the buffer the pointer stored in the forwarding word points to. The figure on the following page provides an illustration of a sample embodiment of applicants' technology. In this example, the buffer has N locations represented by locations [0] through [N-1]. M forwarding words storing pointers to words within the buffer are stored in the M words adjacent to the end of the buffer. As an example, the pointers associated with the first three forwarding words are displayed as arrows depicted in the figure to the right of the buffer. These forwarding words, represented by locations [N] through [N+M-1], have a "forward enable bit" set so that when they are accessed, the access is redirected, or forwarded, to the buffer location to which the pointer stored in the accessed forwarding word points. For example, when the forwarding word at location [N+1] is accessed, the access is automatically forwarded to the word in the

buffer at address &buffer+1 (i.e., location [1]). In this manner, the buffer can be accessed successfully without checking for the end of the buffer.



As an example, if a process attempts to write three words in the buffer depicted above, the first word would be written to the location pointed to by the write pointer, location [N-2], and the second word would be written to the location immediately following the location pointed to by the write pointer, location [N-1]. The next write attempt would be to the next location, location [N]. Because location [N] has its forward enable bit set, the write attempt would be redirected to the buffer location pointed to by the pointer stored in location [N], in this case location [0]. Accordingly, when a process attempts to access a word beyond the end of a buffer, applicants' technique redirects the access to a word within the buffer so that the access can perform successfully.

In contrast, Soell is directed to a technique for determining a sequential priority among entries within a circular buffer. Soell's technique uses an "in-pointer" and an "out-pointer" to manage write and read accesses to the buffer. (Soell, 2:49-54, 61-64). When the in-pointer is pointing to the last position in the buffer and a write access is performed, the in-pointer "wraps around" to the first position in the buffer. Soell's technique uses an "active bit string" or "active window string" to identify which "positions of the circular buffer [are] occupied" (i.e., the active window). (Soell, 3:32). Soell's active bit string includes one bit for each location in the buffer, a '1' indicating that the corresponding buffer location is occupied, a '0' indicating that the corresponding buffer location is not occupied. (Soell, 3:34-41). "[W]hen wrap-around occurs, the active [window] is divided into two parts: A front part, ranging from [the first entry position] to the entry position preceding the in-pointer, and rear part, ranging from the entry position specified by the out-pointer up to [the last entry position]." (Soell, 5:1-5).

For each buffer position, Soell's technique copies a bit from the active bit string to an extended bit string via an "unfold" circuit based on the wrap-around status of the buffer and the location of the buffer position relative to the active window. When wrap-around has not occurred or a buffer position is in the "rear part" of a segmented window, the associated active bit is copied to a "real entry position" of the extended bit string. When wrap-around has occurred and a buffer position is in the "front part" of a

segmented window, the associated active bit is copied to a "virtual entry position" of the extended bit string.

Soell's Figure 2B shows the relationship between the active bit string and the extended bit string when wrap around has not occurred. In this example, each bit in the active bit string is copied through an "unfold" circuit to a real entry position in the extended bit string. Soell's Figure 5B shows the relationship between the active bit string and the extended bit string when wrap around has occurred. In this example, position 63 in the bit string is in the "rear part" while positions 0 through 61 are in the "front part." Accordingly, the active bit associated with position 63 is copied to a real entry position in the extended bit string while the active bits associated with positions 0-61 are copied to virtual entry positions in the extended bit string. Soell's extended bit string is used by a priority filter circuit to identify the oldest buffer position matching predefined criteria. Soell's priority filter uses match lines, each match line associated with a buffer position, to determine which buffer positions match the predefined criteria. The match lines can also be used to inhibit match lines associated to buffer positions closer to the last buffer position so that data stored in buffer positions closer to the beginning are given priority. However, when wrap around occurs, the oldest data may be closer to the last position of the buffer than the first position. The virtual entries in Soell's extended bit string are provided to prevent match lines from inhibiting the older entries in the event of wrap around, thereby giving the oldest entry priority.

Claim 1 now recites "storing in a number of forwarding words located adjacent to an end of the buffer, pointers to words in the buffer." The Office Action relies on Soell at 3:14-16, 42-60, 4:9-13, and 5:25-32 as disclosing these features. Applicants respectfully disagree that the relied-upon portions of Soell disclose these features. Soell does not store pointers to words in a buffer. The relied-upon portions of Soell describe an extended bit string and the relationship between the extended bit string and the active bit string. The Examiner seems to believe that either the active bit string or the extended bit string store pointers to words in Soell's buffer. Applicants respectfully

disagree with the Examiner's interpretation of Soell. Both the active bit string and the extended bit string are a string of bits, each bit corresponding to a position in the buffer. Although the bits are associated with buffer positions, Soell does not store pointers to positions in the buffer in either the active bit string or the extended bit string. Soell forwards bits from the active bit string to the extended bit string using forwarding logic of an "unfold circuit" that forwards bits based on the wrap-around status of the buffer and the location of an associated buffer position. Soell's active bit string, however, does not store pointers to the extended bit string or Soell's buffer. Accordingly, Soell does not forward bits from the active bit string to the extended bit string or Soell's buffer based on pointers stored within the active bit string. Furthermore, applicants are unable to find any portion of Soell that teaches or suggests storing any information adjacent to the end of the buffer.

Claim 1 now recites "when a forwarding word is to be accessed, directing the access to the word within the buffer pointed to by the pointer stored in the accessed forwarding word." The Office Action relies on Soell at 4:9-13 and 5:25-32 as disclosing these features. Applicants respectfully disagree that the relied-upon portions of Soell describe these features. Soell does not forward attempts to access a first location to another location based on a pointer stored in the first location. The relied-upon portions of Soell describe forwarding bits from the active bit string to the extended bit string, neither of which store pointers to the other or pointers to Soell's buffer. Soell's technique forwards bits from the active bit string to an associated bit of the extended bit string via an "unfold circuit" that forwards bits to either a "real entry position" or a "virtual entry position" based on the wrap-around status of the buffer and the location of an associated buffer position. Soell's technique does not redirect accesses to the bit strings or Soell's buffer using stored pointers. Johnson does not cure these deficiencies. For the foregoing reasons, applicants submit that claim 1, and its dependent claims 2-29 are patentable over Soell and Johnson and respectfully request that the Examiner reconsider and withdraw the rejections of these claims.

Claim 36 now recites "a component that stores in forwarding words located adjacent to an end of a buffer, addresses of locations within the buffer." The Office Action relies on Soell at 3:14-16, 42-60, 4:9-13, and 5:25-32 as disclosing these features. Applicants respectfully disagree that the relied-upon portions of Soell disclose these features. Soell does not store pointers to words in a buffer. The relied-upon portions of Soell describe an extended bit string and the relationship between the extended bit string and the active bit string. The Examiner seems to believe that either the active bit string or the extended bit string store pointers to words in Soell's buffer. Applicants respectfully disagree with the Examiner's interpretation of Soell. Both the active bit string and the extended bit string are a string of bits, each bit corresponding to a position in the buffer. Although the bits are associated with buffer positions, Soell does not store pointers to positions in the buffer in either the active bit string or the extended bit string. Soell forwards bits from the active bit string to the extended bit using forwarding logic of an "unfold circuit" that forwards bits based on the wrap-around status of the buffer and the location of an associated buffer position. Soell's active bit string, however, does not store pointers to the extended bit string or Soell's buffer. Accordingly, Soell does not forward bits from the active bit string to the extended bit string or Soell's buffer based on pointers stored within the active bit string. Furthermore, applicants are unable to find any portion of Soell that teaches or suggests storing any information adjacent to the end of the buffer.

Claim 36 recites "a component that, when a forwarding word is accessed, directs the access to the location within the buffer corresponding to the address stored in the accessed forwarding word." Claim 49 recites "a pointer in the forwarding word pointing to the beginning of the buffer so that when the forwarding word is accessed, the access can be redirected to the beginning of the buffer." The Office Action relies on Soell at 4:9-13 and 5:25-32 as disclosing these features. Applicants respectfully disagree that the relied-upon portions of Soell describe these features. Soell does not forward attempts to access a first location to another location based on a pointer stored in the

first location. The relied-upon portions of Soell describe forwarding bits from the active bit string to the extended bit string, neither of which store pointers to the other or pointers to Soell's buffer. Soell's technique forwards bits from the active bit string to an associated bit of the extended bit string via an "unfold circuit" that forwards bits to either a "real entry position" or a "virtual entry position" based on the wrap-around status of the buffer and the location of an associated buffer position. Soell's technique does not redirect accesses to the bit strings or Soell's buffer using stored pointers. For the foregoing reasons, applicants submit that claims 36 and 49 and their dependent claims 37-48 and 50-56 are patentable over Soell and respectfully request that the Examiner reconsider and withdraw the rejections of these claims.

Claim 49 recites "a forwarding word adjacent to the end of the buffer." The Office Action relies on Soell at 1:23-26 and 53-58 as disclosing this feature. The relied-upon portions of Soell, however, describe the conditions in which wrap-around occurs, the effect of wrap-around, and the function of the in-pointer. Soell's in-pointer defines the head of the circular buffer and is incremented whenever a new entry is written to the buffer. (Soell, 2:53-57). When a sequence of entries extends beyond the last entry position of a buffer, wrap-around occurs and new entries "are accommodated in the first entry positions of the buffer." (Soell, 1:23-26). Soell, however, does not describe how its technique determines that an access has extended beyond the last entry of the buffer. Soell may check for the end of the buffer by, for example, comparing the address of the buffer location to which the in-pointer points to the address of the last buffer location or comparing the number of writes to the size of the buffer. When the end of the buffer is reached, Soell's technique may automatically set the in-pointer to the first position in the buffer. Soell provides no indication that a forwarding word, or any other information, is stored adjacent to the end of the buffer. Accordingly, claim 49 is patentable over Soell, as are its dependent claims 50-56.

In view of the above amendments and remarks, applicants believe the pending application is in condition for allowance and respectfully request reconsideration.

Please charge any deficiency in fees or credit any overpayment to our Deposit Account No. 50-0665, under Order No. 324758003US7 from which the undersigned is authorized to draw.

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Respectfully submitted,

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